

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-8, 10-16, 25-26, and 31 are pending in the application, with claims 1 and 31 being the independent claims. Claims 27 and 30 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. New claim 31 is sought to be added. Support for these amendments can be found, *inter alia*, at page 5, lines 10-11; page 9, lines 4-5; page 31, lines 17-21. Support for proteins having at least 80% amino acid sequence identity to SEQ ID NO:15 can be found, *inter alia*, at page 27, lines 12-16. Support for new claim 31 can be found, *inter alia*, at page 21, line 11 to page 25 line 2. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objection to the Specification:

The specification was objected to because it did not contain an abstract of the disclosure as required by 37 C.F.R. § 1.72(b). Applicants have amended the specification to include an abstract on a separate sheet. Support for the language in the abstract can be found in the specification at least at page 1, lines 4-6. Therefore, the objection has been rendered moot and Applicants respectfully request that it be withdrawn.

Objection to the Claims:

Claims 1-11, 13, 25, and 27 were objected to for informalities including failing to comply with sequence rules. Applicants have amended these claims and believe that there are no defects with the claims. Therefore, Applicants respectfully request reconsideration of the objection and that it be removed.

Rejections under 35 U.S.C. § 112, first paragraph

Claims 1-8, 10-16, and 25-27 were rejected under 35 U.S.C. § 112, first paragraph as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey that the inventors had possession of the claimed invention. Applicants respectfully traverse this rejection.

Without acquiescing in the propriety of the rejection and solely in an effort to advance prosecution, Applicants have amended claim 1 to recite the nucleic acid encoding the protein of SEQ ID NO:15. Therefore, Applicants assert that the rejection has been rendered moot and respectfully request that the rejection be reconsidered and be withdrawn.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 4, 6, 12, and 16 were rejected under 35 U.S.C. § 112, second paragraph as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Applicants respectfully traverse this rejection.

Applicants have amended the above claims such that their meaning is clear to one of skill in the art. Therefore, Applicants assert that the rejection has been rendered moot and request that the rejection be reconsidered and further that it be withdrawn.

Rejections under 35 U.S.C. § 101

Claims 1-8, 10-12, 14-15, 25, 27, and 30 were rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. Without acquiescing in the propriety of the rejection and solely in an effort to advance prosecution, Applicants have amended the claims to recite the term "isolated" for the nucleic acid claims, and "transformed with" for the plant cell claims, as suggested by the Examiner. Therefore, Applicants believe that the rejection has been rendered moot, and respectfully request that the rejection be withdrawn.

Claims 1-8, 10-16, 25-27, and 30 were also rejected under 35 U.S.C. § 101 as allegedly not supported by either a specific and substantial asserted utility or a well established utility. Applicants respectfully traverse this rejection.

The Examiner first alleges that the claimed invention lacks utility because no specific function has been demonstrated for the protein encoded by the claimed nucleic acid. The Examiner alleges that the state of the art recognizes that while a functional assignment based on sequence comparisons may categorize a protein, they are not always predictive of their functional homology. The Examiner cites Doerks *et al.* in support of this assertion.

Doerks *et al.* is a general article which does not provide any specific examples of the homology and identity ranges which were used in their study and they also do not provide the homology of predicted *functional* regions. For example, Doerks *et al.* state that, "There were even examples in which homology scored best in PSI-BLAST (Ref. 5) that did not have the same catalytic activity because active site residues of the characterized family were not conserved." (Page 248, fourth full paragraph). However, it is known that proteins that do not contain conserved active site residues may not have the same function. Applicants assert that, "DZ2 possesses the conserved amino acid residues required for the

phosphorylation of the receiver domain of the response regulator component." (Specification, Page 24, lines 13-18). Having conservation in the functional region of the ***conserved residues required for phosphorylation*** is a key indicator of function and no further evidence is needed. For as the Examiner acknowledges, "empirical data is not required for patentability..." (Office Action, page 8, line 2).

Secondly, the Examiner asserts that since the specification does not disclose a signal transduction function of the protein, Applicants do not teach how the nucleic acid molecule or its encoded protein would be a benefit to the public. Applicants are not aware of the necessity for proving that an invention must "benefit the public." Rather they need only teach a utility for the invention.

There is ample support for the signal transduction function, as discussed above for the claimed isolated nucleic acid and ample description how to make and use the molecules of the invention. Applicants acknowledge the Examiner's citation of *Brenner v. Manson* (Office Action, Page 9) in support of the assertion that utility which requires that carrying out further research to identify a so-called "real world" context of use is not substantial utility, however Applicants assert the Examiner's reliance on *Brenner* is misguided. Applicants have demonstrated that the nucleic acid of SEQ ID NO:14 encodes a protein (SEQ ID NO:15) which is involved in plant dehiscence. Plant dehiscence is important in the production of seed in all higher plants. Therefore, as concerns the utility of invention, the role of the claimed polypeptide in signal transduction is irrelevant. Thus, Applicants respectfully request that the rejection be reconsidered and be removed.

Claims 1-8, 10-16, 25-27, and 30 were also rejected under 35 U.S.C. § 112, first paragraph. Applicants respectfully traverse this rejection. Applicants assert that there is a

well established utility of the invention based on the arguments made above, and that one skilled in the art would know how to use the claimed invention. Example 1 clearly discusses the isolation and characterization of the molecules of SEQ ID NOs:14 and 15. Furthermore, Example 2 discusses the isolation and characterization of a close homolog of SEQ ID NOs:14 and 15. Lastly, although the examples which discuss downregulation of the polynucleotide of SEQ ID NO:14 may be prophetic, gene regulation through antisense oligonucleotides is well known in the art, and it would not require a skilled artisan undue experimentation to perform such a technique. Therefore, since there is adequate description of the utility of SEQ ID NOs:14 and 15, Applicants respectfully request that the rejection be reconsidered and be removed.

Rejections under 35 U.S.C. § 102

Claims 1-4, 6-8, 10-15, 25 and 26 were rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Nelson *et al.* Applicants respectfully traverse this rejection. Applicants assert that the above stated reference does not disclose either the nucleic acid nor the amino acid of SEQ ID NOs:14 and 15. Since the claims have been amended to recite the sequence of SEQ ID NO:15 or 80% homology, Applicants assert that the rejection has been rendered moot. Therefore, Applicants respectfully request reconsideration of the rejection and be removed.

Other Matters

For the Examiner's convenience, we are resubmitting the form PTO-1449 of the Information Disclosure Statement filed February 22, 2001. Applicants respectfully request

consideration of the cited art and that the Examiner acknowledge consideration of the art by returning an initialed copy of the form PTO-1449. If the previously cited documents are not available, Applicants request that the undersigned representative be contacted prior to the mailing of a subsequent office action.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Version with markings to show changes made

In the Specification:

The following abstract was inserted as new page 41 of the specification:

Abstract of the Disclosure

This invention describes novel plant nucleic acid sequences and proteins. The sequences and proteins are useful in the control of plant dehiscence and in the production of male sterile plants.

In the Claims:

Claims 27 and 30 were cancelled.

Pending claim 1 was substituted with the following claim 1:

1. (Once amended) An isolated nucleic [Nucleic] acid encoding the [a signal transduction] protein of SEQ ID NO:15. [involved in the process of dehiscence.]

Pending claim 2 was substituted with the following claim 2:

2. (Once amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 1 [wherein the process involves] wherein said nucleic acid is involved in the production of a hydrolytic enzyme.

Pending claim 3 was substituted with the following claim 3:

3. (Twice amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 1
wherein said nucleic acid [which] is [naturally] expressed in a dehiscence zone.

Pending claim 4 was substituted with the following claim 4:

4. (Twice amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 1
encoding a protein wherein the protein:

- a) comprises the amino acid sequence shown in SEQ ID NO:15:
[Figure 1 or;]
- b) has one or more amino acid deletions, insertions or substitutions
relative to a protein as defined in a) above, and has at least 80%
[40%] amino acid sequence identity therewith[; or].
- c) comprises a fragment of a protein as defined in a) or b) above which
is at least 10 amino acids long.]

Pending claim 5 was substituted with the following claim 5:

5. (Twice amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 1
which comprises the sequence [set out in] of SEQ ID NO:15 [Figure 1] or a fragment
thereof which is at least 30 bases long.

Pending claim 6 was substituted with the following claim 6:

6. (Twice amended) The isolated nucleic [Nucleic] acid[, as claimed in] of claim 1
which is expressed in the dehiscence-zone in combination with one or more further nucleic
acid sequence [which is dehiscence-zone expressed].

Pending claim 7 was substituted with the following claim 7:

7. (Twice amended) An isolated nucleic [Nucleic] acid which is antisense to the
nucleic acid [as claimed in] of claim 1.

Pending claim 8 was substituted with the following claim 8:

8. (Twice amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 1
including a promoter or other regulatory sequence which controls expression of the nucleic
acid.

Pending claim 10 was substituted with the following claim 10:

10. (Twice amended) A vector comprising the isolated nucleic acid of claim 1.
[Nucleic acid as claimed in claim 1 which is in the form of a vector.]

Pending claim 11 was substituted with the following claim 11:

11. (Twice amended) A cell transformed with the [comprising] nucleic acid [as
claimed in] of claim 1.

Pending claim 12 was substituted with the following claim 12:

12. (Once amended) The transformed cell of claim 11 which is a plant cell [A plant cell as claimed in claim 11].

Pending claim 13 was substituted with the following claim 13:

13. (Twice amended) A process for obtaining a cell comprising introducing the nucleic acid [as claimed in] of claim 1 into said cell.

Pending claim 15 was substituted with the following claim 15:

15. (Twice amended) A process of propagating [Propagating] material or a seed comprising growing the [a] cell [as claimed in] of claim 12.

Pending claim 16 was substituted with the following claim 16:

16. (Twice amended) A process for obtaining a plant or plant part comprising obtaining a cell [as claimed in] of claim 11 and growing said cell [growth thereof].

Pending claim 25 was substituted with the following claim 25:

25. (Twice amended) The isolated nucleic [Nucleic] acid [as claimed in] of claim 4 wherein said nucleic acid [which] is a probe.

New claim 31 was added:

31. (New) An isolated nucleic acid having the sequence of SEQ ID NO:14.